

Furthermore, the finding of *Abbreviata* sp. in *Varanus beccarii* appears to be a new host record (Baker, 1987).

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Research Note

Helminth Parasites of the Osprey, *Pandion haliaetus*, in North America

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ABSTRACT: A total of 28 species of helminths (17 trematodes, 3 cestodes, 7 nematodes, and 1 acanthocephalan) was recovered from 17 ospreys (*Pandion haliaetus*) from the United States. Intensities of infection were low and no lesions were attributed to the parasites. Seven species appear to be specialists in ospreys, 2 species generalists in raptors, and the remainder generalists in other orders of fish-eating birds. *Pandion-trema rjkovi*, *Diasiella diasi*, and *Contracaecum pandioni* are reported for the first time from North America.

KEY WORDS: helminths, osprey, parasites, *Pandion haliaetus*, *Pandion-trema rjkovi*, *Diasiella diasi*, *Contracaecum pandioni*.

The osprey, *Pandion haliaetus* (Linnaeus), is a cosmopolitan, monotypic member of the family Falconidae comprising its own subfamily, Pandioninae. Ospreys breed primarily in the Northern Hemisphere (North America and Eurasia) and winter in the Southern Hemisphere (South America, Africa, and India), with the exception of 2 nonmigratory subspecies in the Caribbean and Indonesia (Poole, 1989). Although this predominantly fish-eating raptor was considered threatened in North America in the 1960's because of pesticide contamination of the food chain, it has made a strong recovery and is now common in many parts of its former range (Ewins, 1994).

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Table 1. Prevalences and intensities of helminths of 5 ospreys in Florida.

	HWML No.	Location in host*	Prevalence		Intensity	
			No. inf.	%	Mean	Range
Trematoda						
<i>Scaphanocephalus expansus</i> (Creplin, 1842)	36935	SI	2	40	361	17-704
<i>Mesorchis denticulatus</i> (Rudolphi, 1802)	36936	SI	3	60	81	2-232
<i>Ribeiroia ondatrae</i> (Price, 1931)	36938	P	2	40	33	11-54
<i>Renicola ralli</i> Byrd and Heard, 1970	36934	K	3	60	96	14-167
<i>Neogogatea pandionis</i> (Chandler and Rausch, 1948)	—	SI	2	40	89	9-169
<i>Micropharyphium facetum</i> Dietz, 1909	36937	C	1	20	2	2
Cestoda						
<i>Paradilepis rugovaginosus</i> Freeman, 1954	—	SI	1	20	3	3
Nematoda						
<i>Capillaria falconis</i> (Goeze, 1782)	—	SI	1	20	1	1
<i>Sexanoscara skrjabini</i> Sobolev and Sudarikow, 1939	—	E	1	20	3	3
<i>Tetrameres</i> sp.	—	P	2	40	7	3-10
<i>Contracaecum pandioni</i> Sobolev and Sudarikow, 1939	—	P	1	20	1	1
<i>Contracaecum multipapillatum</i> (Drasche, 1882)	36939	P	2	40	9	7-10
<i>Cardiofilaria pavlovskiyi</i> Shtrom, 1937	36940	BC	1	20	1	1
Acanthocephala						
<i>Andracantha mergi</i> Lundstrom, 1941	36941	SI	1	20	4	4

* Location in host: BC = body cavity, C = cloaca, E = esophagus, K = kidney, P = proventriculus, SI = small intestine.

Perhaps because of its protected status, the osprey has not been surveyed for helminth parasites in either North or South America. Isolated records from North America include a few trematodes (*Scaphanocephalus expansus* by Hoffman (1953), *Neogogatea pandionis* and *Nematostri-gea serpens* by Chandler and Rausch (1948), and *Renicola lari* by Kennedy and Frelie (1984)); 2 cestodes (*Paradilepis rugovaginosus* by Freeman (1954) and *Paradilepis simoni* by Rausch (1949)); and 1 nematode (*Sexansocara skrjabini* by Schmidt and Huber (1985)). In this report, we combine records of osprey helminths collected at the Department of Pathobiology, University of Florida (UF), Gainesville, and the National Wildlife Health Center (NWHC), Madison, Wisconsin.

Five injured or dead ospreys submitted to the Department of Pathobiology (UF) between October 1974 and September 1978 were examined at necropsy according to the methods of Kinsella and Forrester (1972). Ospreys submitted to the NWHC were examined for cause of death and helminths were collected when found, but parasite examinations were incomplete and not quantitative. Helminths were collected from 12 birds between November 1991 and April 1994. Voucher specimens of helminths were deposited

in the Harold W. Manter Collection of the University of Nebraska, Lincoln.

A total of 28 species of helminths (17 trematodes, 3 cestodes, 7 nematodes, and 1 acanthocephalan) was recovered from the 17 ospreys. Prevalences and intensities of helminths from the 5 completely necropsied birds are listed in Table 1. Although the sample size was small, intensities were low and no significant lesions were associated with any of the infections. In Table 2, we list helminths and collection localities for the other 12 birds. Again, helminth infections were not implicated as the cause of significant lesions or death in these hosts. *Pandion-trema ryjikovi*, *Diasiella diasi*, and *Contracaecum pandioni* are reported from North America for the first time.

Seven species can be considered specialists in ospreys (helminths only reported from 1 host species). Three of these (*N. pandionis*, *P. rugovaginosus*, and *P. simoni*) have been reported only from North America. The other 4 (*P. ryjikovi*, *S. expansus*, *C. pandioni*, and *S. skrjabini*) have been reported now from both North America and Eurasia (Sobolev and Sudarikow, 1939; Dubois, 1960; Oshmarin and Parukhin, 1960). This number of specialists is large in comparison to other avian hosts and may reflect the osprey's

Table 2. Helminths from ospreys examined at the National Wildlife Health Center, Madison, Wisconsin.

Helminth species	HWML No.	Location in host*	Collection localities
Trematoda			
<i>Scaphanocephalus expansus</i> (Creplin, 1842)	—	SI	Florida
<i>Mesorchis denticulatus</i> (Rudolphi, 1802)	—	SI	Florida
<i>Ribeiroia ondatrae</i> (Price, 1931)	—	P	Virginia, Massachusetts
<i>Neogogatea pandionis</i> Chandler and Rausch, 1948	38381	SI	Virginia
<i>Diasiella diasi</i> (Travassos, 1922)	38581	SI	Virginia
<i>Pandiontrema ryjikovi</i> (Oshmarin and Parukhin, 1960)	38105	SI	Washington
<i>Nematostrirea serpens</i> (Nitzsch, 1819)	38104	SI	Virginia
<i>Mesophorodiplostomum pricei</i> (Krull, 1934)	38386	SI	Florida, Massachusetts, Montana, Virginia
<i>Neodiplostomum</i> sp.	—	SI	Maryland
<i>Phagicola longa</i> Ransom, 1920	38387	SI	Florida, South Carolina
<i>Phagicola</i> sp.	—	SI	Florida
<i>Ascocotyle</i> sp.	—	SI	South Carolina
<i>Echinochasmus dietzevi</i> Issaitschkoff, 1927	38382	SI	Florida
<i>Cryptocotyle lingua</i> (Creplin, 1825)	38380	SI	Massachusetts
<i>Pygidopsis pindoramensis</i> Travassos, 1929	38385	SI	Florida
Cestoda			
<i>Paradilepis rugovaginosus</i> Freeman, 1954	38106	SI	Maryland
<i>Paradilepis simoni</i> Rausch, 1949	38384	SI	Montana
<i>Cyclustera ibisae</i> (Schmidt and Bush, 1972)	38383	SI	Florida
Nematoda			
<i>Capillaria falconis</i> (Goeze, 1782)	—	SI	Florida
<i>Sexanoscara skrjabini</i> Sobolev and Sudarikow, 1939	38394	E	Maryland
<i>Tetrameres</i> sp.	—	P	Virginia
<i>Contracaecum multipapillatum</i> (Drasche, 1882)	—	P	Florida, South Carolina
<i>Contracaecum spiculigerum</i> (Rudolphi, 1809)	—	P	Massachusetts, Montana, Virginia
<i>Contracaecum</i> larvae	—	P	Florida, Washington
Acanthocephala			
<i>Andracantha mergi</i> (Lundstrom, 1941)	—	SI	Massachusetts

* Location in host: E = esophagus, P = proventriculus, SI = small intestine.

reproductive and ecological isolation from other raptors since the Pleistocene (Poole, 1989).

All of the remaining helminths that could be identified to species can be considered generalists, found in more than 1 host species. In an earlier study on 6 species of hawks and falcons in Florida (Kinsella et al., 1995), the majority of helminths were judged to be generalists in raptors, not found in other orders of birds. In contrast, only 2 generalists in the osprey, *Capillaria falconis* and *N. serpens*, are restricted to raptors. The rest appear to exhibit ecological rather than host specificity and are found in members of other orders of fish-eating birds, including Anseriformes and Pelicaniformes (e.g., *Ribeiroia ondatrae*, *Phagicola longa*, *Cryptocotyle lingua*, *Contracaecum multipapillatum*, *Contracaecum spiculigerum*) (McDonald, 1969).

Perhaps the most unusual record found here was 3 specimens of *D. diasi* in the small intestine of an osprey from Virginia. This trematode was described from the pancreas of anhingas, *Anhinga anhinga*, in Brazil by Travassos (1922) and has recently been found in cysts on the pancreas of a great blue heron in Florida (Kinsella and M. G. Spalding, unpubl. data) and in the intestine of a bald eagle, *Haliaeetus leucocephalus*, from Virginia (Cole, unpubl. data). The pancreas appears to be the normal site of infection for this trematode, and its presence in the intestine of the osprey and eagle may be due to postmortem migration.

Although life-cycle data are not available for any of the 7 osprey specialists, it is highly probable that most are acquired through the ingestion of fish intermediate hosts, both freshwater and

marine. The osprey's diet consists almost exclusively (>99%) of fish (Poole, 1989; Ewins, 1994), and more data on helminth distribution will provide clues to the identity of intermediate hosts.

A few of the trematode generalists found (*Phagicola longa*, *Cryptocotyle lingua*, and *Ascocotyle* sp.) have life cycles primarily associated with estuarine and marine ecosystems and were found only in birds from coastal states such as Florida and South Carolina. These species could potentially act as biological tags reflecting the migratory behavior of the host; however, the host collection data provided in the present study was not precise enough to warrant any such conclusions.

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